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AUTHOR Huttenlocher, Janellen; Smiley, Patricia
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ABSTRACT

This study examined word meanings in the single word period of language learning. Ten children were seen for 5 hours each month from the time they started learning language until their median length of utterance was 2.5 words. All the children's utterances, and the extralinguistic contexts of the utterances, such as objects and movements, were recorded. Two issues involving words used in relation to movement were addressed: (1) whether words encoded events or were merely associates of events in the manner described in the literature as "complexive"; and (2) the kinds of events words encoded when they did encode events. Words used by four or more children were analyzed. These words included four verbs, four spatial prepositions, one possessive adjective, and one noun. All but one of the words used in the absence of movement indicated a request implying movement. Thus, the words were not being used complexively. It was not clear what aspects of movement were being encoded. The evidence that the words were used for others' selves as well as the child's self suggests that the words were not used to encode intentional behavior of a person. (BC)

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Early Words for Movement

Janellen Huttenlocher and Patricia Smiley

SRCD Meeting, April 1991

In this talk I will discuss some results from a study on early word meanings I have done in collaboration with Pat Smiley. In this study, we followed 10 children. They were seen for 5 hours each month, from the very start of language learning until their MLU was 2.5. We recorded all utterances the children produced, together with their extralinguistic contexts--the objects present, their properties, movements, locations, etc. The purpose of the study was to examine word meanings in the single word period. Hence for each different word that appeared in the single word period, we examined all uses and grouped words in terms of the aspects of contexts in which they frequently occurred. We found that the words acquired very early in language learning, between 12 and 18 months, fell into different classes. For two of these classes, there were many words. In one class, each of the words was used chiefly in the presence of small objects of a particular kind. In the other class, each of the words was used chiefly in relation to movements of a particular kind. In addition, there were other classes of words, such as person names, greetings, etc.

Here I will be concerned with those early words that were often used in relation to movements of particular kinds. I will call them event words. They include a few verbs, notably open and sit, but mainly words that are not verbs, like down and off. I want to take up two issues regarding these early event words. The first issue is whether the words actually encode events, or are merely associates of events in the manner described in the literature as "complexive." The second issue is one which arises because these early event words do encode events, namely, what kinds of events they encode. In exploring both of these issues, we examine, for each word, the extralinguistic contexts of use in the single word period. In addition, in exploring the second issue, we trace each word into the multi-word period, examining how it is used in combination with other words.

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Let me start with the first issue--the possibility that the early words frequently used in relation to movement have a complexive character. According to the classical notion of a complex, a word may be used when a particular movement occurs, yet not be a symbol that encodes that movement. Rather, the word may be an associate of the general situation. Movements of a particular sort tend to occur in certain kinds of situations involving typical objects, locations, etc. In such situations, a given word may be said by caregivers. For example, the word up may be used near the high chair in the kitchen as the child is being lifted into that high chair. The notion of a complex is that the child does not differentiate out the movement as the relevant factor in the situation or the word as a symbol to encode that movement.

Examination of the contexts in which children produce particular words may reveal whether they are being used complexively. If words are associates of the general situations in which they are used, and movement is not the critical factor, there should be a considerable number of utterances to habitual associates of the movement even in the absence of the movement itself; for example uses of up in relation to the high chair in the kitchen.

A problem may arise with this line of evidence, however. Suppose that children who use only one word at a time use those words symbolically to encode particular sorts of movements. Suppose also that they may use the words in the same range of contexts in which an adult might use them--not only in describing what is present, but also in making requests and comments. For example, the child standing near the high chair might say up to comment that such movement often occurs in this context. If comments of this sort are frequent in single word speech, it may not be possible to distinguish between complexive uses of a word and symbolic uses to encode movement. However, there would be no difficulty establishing that usage is not complexive if utterances in the absence of movement are made chiefly with request intonation under conditions when the children clearly want help with achieving that movement.

To anticipate, there is no evidence to support the complex interpretation except, possibly, for one word. Hence the next issue concerns the meanings of these early event words. We want to infer the nature of the child's meaning, if we can, by examining the extralinguistic contexts

across uses of a particular word. For uses where movement is present, that movement may involve either a single entity, or more than one entity. Only for a person or other animate can there be just a single entity in which movement is ongoing. Movement in an inanimate object generally is initiated by a person. Hence an ambiguity arises in cases where movement occurs in an object. The word might encode movement of the person, movement of the object, or the relation between the person and the object, possibly the causation of object movement by the person. Further, since a person initiates the movement, another issue arises. A word may encode either intentional behavior or simply movement.

There is a set of event words that do encode intentional behaviors which appear somewhat later, typically between 19 and 23 months. Most of the behaviors encoded involve relations of persons to objects, including causation of change in those objects. These later words are verbs in the adult language. Included are words such as get, push, etc. We explored the meanings of these words in an earlier study. The evidence that they encode intentional behavior is that they generally are said as children start to carry out the named actions. In about half the cases, the words are preceded by the child's name or "I", presumably as a subject term. In fact, these words for action and words for self tend to emerge at about the same time.

An additional point to be made about these later event words is that they initially encode only children's own behaviors, not the behaviors they observe in other people. There are two kinds of evidence. First, for a period of time the words are not used for observed actions (Huttenlocher, Smiley, and Charney; 1983). This is not because they won't say the words without a subject term and lack words for other persons. Not only do children's sentences lack a subject term half the time, but also children do have words for other persons early on. In fact, mommy, daddy, and a few proper names emerge considerably earlier than words for the self. Second, comprehension testing showed the children could not successfully choose between alternative observed actions in brief movies even after they use those very words to encode their own actions.

We are concerned with the types of events children group in their use of particular words. We want to know if these words encode movement in a single entity, or a relation between person

and object. We also want to know if early event words, like later ones, encode intentional behaviors or if they simply encode movement.

Let me turn to the data. All children used certain words frequently in relation to movement in the single word period. The median number of different event words used by a child was 10 over the single word period. We consider here the words used by 4 or more children. These words are sufficiently frequent to allow us to explore the contexts of use. The words are shown in the first overhead. They are ordered by total frequency of use over the 5 hour observation periods each month during the single word period. Only four of the words are verbs in the adult language, four are spatial terms, one is a possessive adjective, and one is a noun in the adult language. The next row shows the number of children using each of the words.

The first question to be answered is whether these words are used complexively, or whether they encode movements of a particular sort. In considering this issue, we divided utterances into uses where movement was present and uses where movement was absent. The next rows show the data on contexts of use that are relevant to this issue. For eight of the words the percent of uses in the presence of movement is approximately 60% or, in some cases, much higher. The next two rows show total numbers and percent of absent movement uses.

Let's consider uses in the absence of movement. Recall that we expect these to be used in habitual contexts if the words form complexes. Recall also that even if the words have an adult sort of meaning, they may be used in the absence of movement because children may make requests and comments. We want to see if the contexts of use might allow us to decide whether the words are used complexively. The problematic cases are non-request uses which might or might not be comments. The issue does not come up for most of the words. Requests are by far the most frequent uses in the absence of movement. Consider <u>open</u>, one of two words with low present movement use. <u>All</u> uses in the absence of movement are requests. The contexts of these requests were ones in which the child obviously wanted the particular movement to be carried out. The child may be holding a box or jar up to the parent. In fact, requests together with present

movement uses make up most uses for all the words except ride, which is used frequently in habitual contexts without request intonation. Possibly ride forms a complex.

The next issue concerns the meanings of these words. The next overhead indicates the movements present when particular words were said. The headings on the left separate uses involving movement by the child, the first two rows, from uses involving movement by other people, the next two rows. The headings also separate movement involving only a person, rows one and three, from movement involving both a person and an object, rows two and four. All the words are used frequently for movements involving both a person and an object. Three of them, down, up, and out, also are used for movements involving only a person. We have included under present movements cases we call similar movements. Take down for example. It was usually said while a person or an object moved in a downward direction. However, down was sometimes said for movements of opposite directionality; e.g., down for upward movement. For several other words also, there are some uses for highly similar movements, almost always involving opposite directionality. If down is used for movements both down and up, that would indicate a more general category of movement than if it were used only for downward movement, namely vertical movement.

It is clear that the words encode movements of particular sorts. Let me briefly describe these where it is not completely obvious. My or mine were said while pulling objects toward the self or occasionally for giving objects. Rock was said while rocking self or a chair or horse on rockers. Door was said while moving a door, and sit for sitting or making a doll sit.

It is not clear what aspects of movement are encoded by the words, since the most frequent type of use is for movements involving objects. Hence the words might involve movement in the person, movement in the object, or causation of movement in the object by the person. There is some evidence that the words are not used to encode intentional behavior of a person. It is that the words are used for other people as well as self. Recall that we obtained evidence earlier that the intentions of others are not encoded even somewhat later, in early multi-word speech. Therefore

early use for others as well as self suggests that these words encode movement not intentional behavior.

Multi-word uses of these early event words might potentially be informative with respect to the meanings in the single word period. If these early words are used later in combination with object or person words to encode events, we could determine what word precedes the event word as a subject term. If, in contrast to later event words, these are preceded by words for objects, it would indicate that they encode just movement in an object.

The first point to be made about multi-word speech is that early event words that are not verbs are not used in multi-word utterances to encode events. Rather, in even the very earliest two word sentences they are used in a way that is consistent with the adult language. For door, a majority were as the object of the verbs open or close. That is, usage is consistent with door being a noun--an object name. My and mine become differentiated from one another in multi-word usage. Over 90% of utterances of my are as adjectives; my juice, my socks, etc. Over 90% of utterances with mine are with demonstratives or interrogatives; this mine, where mine. The words we can consider further are the spatial terms. The next overhead shows the ways the four spatial terms are used in sentences. Clearly the most frequent use is as a verb particle. However, in 19% of instances the words do encode events, in that they are used in combination with an object or person name. Let's explore these uses of the spatial terms.

The next overhead shows the words which precede event words for movements in relation to objects. We include transitive verbs, spatial terms, and intransitive/causative verbs. The greatest frequency of use is for children's acts on objects. Let us look at these uses, considering the contrast between transitive verbs and spatial terms. Transitive verbs in the adult language take animate subjects. The proportion of cases with no subject term is similar for transitives and spatial terms. However, there is an enormous contrast between the types of terms which precede these words where there is one. For transitive verbs, 403 uses had self as subject, whereas the number preceded by words for objects or other persons was negligible. For spatial terms, 78 uses were preceded by an object name, whereas the number preceded by a person word was negligible. This

would seem to be clear-cut evidence that spatial words encode movement in an object, not movement by a person.

Let us look also at intransitives and causatives which were used in the single word period. Note that the words open and go were preceded by both person words and object words. Since the words encode movement in any sort of entity, intentionality may not be an element of meaning for these words, although it is possible that they are causatives, as open surely will become.

In conclusion, there is a set of early words used in relation to particular sorts of movement. The words are used for other persons as well as the self. The inclusion of others, which contrasts with later words that encode intentional behavior, suggests that these words do not. Further evidence about early event words is found in multi-word speech. Most of the words are no longer used for events. Those early words which are used to encode events in multi-word speech were preceded by words for objects, not persons (e.g. "Book down."). Usage is consistent with the view that the words encode movement in a single entity.

The meanings of words acquired at the very beginning of language learning must be inferred from pairings of words with aspects of the extralinguistic context, whereas the meanings of later words can be inferred, in part, from linguistic contexts as well. We find a set of early event words used in relation to events that may well be conceptualized as particular sorts of directed movement, possibly movement in a single entity. By the time these words appear in multi-word speech they do not, for the most part, encode events. One possible interpretation is that directed movements can be pointed out in situations, without knowledge of other words or syntax, and that early encodings of such movements provide stepping stones for acquiring the later functions of the words. But to explore this issue will require further work.

Table 1: Contexts of Use of Movement Words in the Single Word Period

	Word									
	Down	My/mine	Up	Off	Ride	Out	Open	Rock	Door	Sit
Frequency	194	156	150	69	64	48	43	34	32	26
No. of children using	10	7	8	5	5	5	5	5	4	4
Contexts of Use										
Present movement	113	137	99	59	24	26	16	29	20	17
% of Total	58	89	66	83	38	54	37	85	63	65
Absent movement	81	19	51	10	40	22	27	5	12	9
% of Total	42	11	34	17	62	46	63	15	37	35
Request	76	11	45	10	12	20	27	0	8	9
Non-request	4	4	6	0	27	2	0	5	4	0
Uninterpretable	1	4	0	0	1	0	0	0	0	0

Table 2: Contexts of Present Instance Uses in the Single Word Period

	Word									
	Down	My/mine	Up	Off	Ride	Out	Open	Rock	Door	Sit
Child	74	0	68	2	0	4	0	1	0	10
Object by child	19	89	15	34	22	14	10	26	16	5
Other	6	0	2	1	0	2	0	0	0	1
Object by other	1	15	1	5	2	0	3	2	1	0
Similar	11	0	9	0	0	1	0	0	0	0
Similar on object	1	12	4	13	0	5	2	0	1	1
State	1	21	0	4	0	0	1	0	2	0

Table 3: Uses of Spatial Terms in Multiword Utterances

		Type of Use				
Word	Frequency	Event	Verb particle	Location phrase	Verb particle +location phrase	Idioms
Down	629	77	425	43	82	2
Up	334	43	108	90	51	42
Off	284	115	160	5	3	1
Out	125	27	76	14	8	1
% of Total		19%	56%	11%	11%	3%

Table 4: Subject Terms in Multiword Utterances For Events Involving Objects

Context of Use	Type of event word	Frequency	None	Self	Other	Inanimate	?
With objects							
Child act	Transitive verbs	679	261	403	3	1	11
	Spatial terms	157	67	4	3	78	5
	Intrans./ causative verbs	502	333	62[a]	3	103[b]	1
Others' acts	Transitive verbs	39	23	0	14[c]	0	2
	Spatial terms	12	7	0	0	4	1
	Intrans./ causative verbs	18	11	0	4	2	1

[a]35 are open, 15 close, 11 go, and 1 come.

[b]46 are go, 38 sit or sit down, and 10 open.

[c]These include get, push, play, fix, and find.